

REMARKS

Claims 1-12 are in the application. Claim 11 stands allowed.

Claims 1, 7-10 and 12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over either Milojevic et al. (US 5,762,548) or Josefsson (UK patent app. 2 124 752A) in view of Tong, et al. (US 6,146,264). The Examiner states that it would be obvious to one having ordinary skill in the art at the time the invention was made to provide the paint booth of Milojevic et al. or the United Kingdom patent with an airflow detector, as taught by Tong et al. in order to control cross flow.

Claims 2-6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over either Milojevic et al. or Josefsson as applied to Claim 1, and further in view of Tong et al. (US 6,139,421). The Examiner states that Milojevic or Josefsson disclose the claimed invention except for the variable density filter media, that Tong et al. ('421) teaches that it is known to provide a paint booth with variable density filter media, and that it would be obvious to one having ordinary skill in the art at the time the invention was made to provide the paint booth of Milojevic et al. or Josefsson with variable density filter media as taught by Tong ('421) in order to promote even flow.

Claims 1-10 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter, inasmuch as Claim 1, lines 10-11, uses the term "generally" to describe the position of the secondary plenum generally above a paint spray applicator.

Applicant is amending Claims 1 and 12 to add three further limitations: first, to add that the claimed system dynamically adjusts the velocity of air from the secondary plenum based on continuous real-time measurements of data inputs including air velocity; second, to claim that the

air velocity measuring device measures the velocity of the contiguous linear airflow between the secondary plenum outlet and the workpiece, and third, that the secondary plenum is enclosed within the primary plenum.

I. CLAIMS 1, 7-10 AND 12 ARE NOT OBVIOUS AND SHOULD BE ALLOWED.

Applicant respectfully traverses these rejections and requests that the Examiner reconsider Claims 1, 7-10 and 12, as amended, in view of these remarks, and that they be passed to issue as amended.

Milojevic and the UK patent both disclose systems in which fresh air supplied from a common source is segregated to separate compartments located above different portions of a paint booth through the use of ductwork with adjustable dampers or apertures. Both Milojevic and the UK patent deal with techniques of varying the distribution of higher-pressure air supplied from a common source to separate compartments above a paint booth with a permeable ceiling, thus permitting variable velocity of airflow within different portions of a paint booth.

Tong ('264) deals primarily with controlling cross flows of air between adjacent paint booth chambers that result from pressure imbalances between chambers. The '264 patent discloses a closed-loop airflow system to control the cross flow of air throughout an entire multiple-chamber paint booth. The '264 patent discloses and claims using an anemometer to measure velocity along two axes to facilitate production of desired "target" velocities of 1) down flowing air at the abutment between chambers, and 2) cross flowing air between chambers at multiple locations within a paint booth system. Tong ('264) at columns 5 and 6 and Claim 2.

The Applicant's invention is novel and not obvious in view of the art cited by the Examiner for at least three reasons. First, the claimed invention permits dynamic adjustment of downdraft air velocity at one or more critical locations within the paint booth in real time, *i.e.*, many adjustments per second. The application emphasizes this aspect in its title and throughout the specification. See paragraph 6 (discussing active control of airflow and dynamic adjustment of airflow over workpiece in real time); paragraph 7 (discussing active control of air supplied to secondary plenum permitting accurate adjustment for variable conditions even in systems also

using other dynamic adjustment systems). The amendments to Claim 1 and Claim 12 make this an explicit limitation. The prior art recognizes the utility of having different downdraft velocities in different portions of a paint booth, and discloses several means of permitting adjustment of airflow in those portions. But the prior art neither teaches nor suggests dynamically adjusting air velocity within key areas of a paint booth based on continuous measurements of data, including changes in air velocity at multiple locations. Compare Application paragraph 17 (damper controller adaptable to receive variety of input variables, including air velocities, atmospheric pressure at various locations, position of paint spray applicator, etc.).

Second, Applicant's invention is not obvious because it combines continuous dynamic adjustment of air velocity with a capability to measure and control downdraft velocity near the workpiece surface. Tong ('264) measured and controlled air velocity, in both horizontal and vertical dimensions, at the "air curtain" between adjacent chambers of a paint booth system, but did not address measurement and control of air velocity at the workpiece surface. The cited prior art neither teaches nor suggests measuring and dynamically adjusting air velocity near the workpiece. Instead, previous systems typically required an expensive and laborious iterative process of measuring and adjusting airflows. These features of the prior art were not well suited to accommodate changes in temperature, humidity, and air pressure that are routinely encountered in practice. The amendments to Claim 1 and Claim 12 make plain that applicant's claims are limited to systems measuring the velocity of the airflow stream between a secondary plenum outlet and the workpiece.

Third, Applicant's invention is novel and not obvious because it combines 1) dynamic adjustment capability and 2) measurement and control of air velocity near the workpiece surface with 3) a controllable secondary plenum enclosed entirely within a primary plenum. Both

Milojevic and Josefsson (the UK patent) permit adjustment of airflow directed to different portions of a paintbooth chamber, but they require separate ductwork from a common source to supply target areas. The Applicant discovered that superior results were obtained by focusing on measuring and dynamically controlling the air velocity impacting the workpiece surface, and further discovered that enclosing a controllable secondary plenum within a primary plenum yielded these superior results with less ductwork and space than systems such as disclosed by Milojevic and Josefsson. Applicant's invention produces superior and more consistent paint finish results compared to any previously known airflow control technique, using a simple but elegant approach that is both relatively uncomplicated and highly adaptable to various environmental conditions and paint applications – particularly when combined with variable density filter media. Applicant's claimed invention is also particularly well adapted for use in multi-cell systems where air supplied to various paintbooth cells is frequently adjusted in order to balance lateral airflows between cells. Applicant's amendments to Claim 1 and Claim 12 make explicit that the secondary plenum is enclosed within the primary plenum.

Milojevic and the UK patent discuss the utility of having different downdraft velocities within a paintbooth and a means of adjustment, and Tong '264 discusses measuring velocity to control cross flows between chambers. However, these references in combination neither teach nor suggest a means for precisely measuring and controlling in real time the true air velocity at the workpiece surface.

Indeed, the configurations of the Milojevic and Josefsson air supply systems teach away from focused control and adjustment of air velocity directly above the horizontal portion of a workpiece. Milojevic describes a system where the controllable air supply segments extend across the entire width of the paintbooth chamber. 5,762,548 column 6 lines 10-11. Similarly,

Josefsson describes a system where downdraft is varied in three zones oriented laterally along the entire length of the paintbooth chamber. GB 2 124 752 A page 2 lines 33-34. In contrast, Applicant's invention allows targeted control of only the air that impacts the horizontal portion of the workpiece, permitting different downdraft velocities forward, aft, and to either lateral side of the workpiece.

Applicants respectfully suggest that the Examiner is engaging in hindsight reconstruction of Applicants' invention. In Dennison Mfg. Co. v. Panduit Corp., the Supreme Court cautioned that "in addressing the question of obviousness [a judge] must not pick and choose isolated elements from the prior art and combine them so as to yield the invention in question if such a combination would not have been obvious at the time of the invention." 475 U.S. at 810, 229 USPQ at 479.

In this case, Neither Milojevic nor Josefsson teach or suggest anything about dynamic control, which is critical to Applicant's claimed invention. Neither Milojevic, Josefsson nor Tong '264 teach measurement and control of air velocity directly at the workpiece surface. Indeed, Milojevic and Josefsson both teach away from using a controllable secondary plenum within a primary air supply plenum. The Examiner's rejection is predicated upon the hindsight reconstruction phenomenon that the Supreme Court inveighed against in Dennison. As a result, Claims 1, 7-10 and 12 are in condition for allowance and should be passed to issue. Such action is earnestly solicited.

II. CLAIMS 2-6 ARE NOT OBVIOUS AND SHOULD BE ALLOWED

Applicant respectfully traverses this rejection and requests that the Examiner reconsider Claims 2-6 in view of these remarks, and that they be passed to issue over the Examiner's rejection.

Most important, Claims 2-6 depend from Claim 1 and should therefore be allowed and passed to issue for the reasons stated above in part I.

Moreover, Tong (US 6,139,421) does disclose using variable density filter media in a paintbooth to control airflow velocity at different portions of the paintbooth. However, '421 neither teaches nor suggests using variable density filters as a flexible and cost effective means of creating the necessary air pressure differential between a primary plenum and enclosed secondary plenum. See Application paragraph 16 (discussing functionality of average unit density across primary plenum and secondary plenum outlets). Using variable density filter media to achieve the necessary pressure differential, versus more conventional damper or aperture restrictions, was not obvious.

Further, Applicant emphasizes that his invention focuses on measuring and controlling the velocity of the air that carries the paint particles impacting the workpiece surface being painted. In contrast, and as discussed above, the Milojevic and Josefsson air supply systems are configured to control air across the entire width or lateral length of the paintbooth chamber, respectively. The cited references, whether singly or in combination, do not teach or suggest combining variable density filters with a controllable secondary plenum to create a flexible, cost effective, yet highly accurate and responsive paint booth air supply system. In this sense, the Examiner's rejection is again predicated upon the hindsight reconstruction phenomenon that the Supreme Court inveighed against in Dennison Mfg. Co. v. Panduit Corp., 475 U.S. at 810, 229 USPQ at 479.

For these reasons, Claims 2-6 are in condition for allowance and should be passed to issue. Such action is earnestly solicited.

III. CLAIMS 1-10 ARE SUFFICIENTLY DEFINITE AND SHOULD BE ALLOWED.

The Examiner rejects Claim 1 and all its dependent claims because Claim 1 states a limitation that the secondary plenum outlet is “generally above a paint spray applicator within said paint booth.” Applicant respectfully traverses this rejection and requests that the Examiner reconsider Claims 1-10 in view of these remarks, and that they be passed to issue over the Examiner’s rejection.

Applicant anticipates that in most cases the secondary plenum outlet will be above a paint spray applicator. The specification provides, however, that the position of the spray applicator may move. See Application, paragraph 17 line 19 (noting position of spray applicator as possible input variable). Some paint configurations may require the spray applicator to move forward, aft, or side to side, and sometimes beyond the lateral edges of the secondary plenum. Further, it is possible that a paintbooth could be configured to allow the secondary plenum itself to tilt, directing higher velocity airflow at a downward angle, past the spray applicator to the workpiece. Relatedly, Claim 1 and Claim 12 have been amended to state that the measuring device measures the velocity of the contiguous airflow stream between the secondary plenum outlet and the workpiece.

Claim 1 as amended clearly and definitely describes the claimed invention. The Examiner has previously allowed use of the word “generally” in claims in similar circumstances. See US 6,368,207 (stating in Claim 1: “said structure comprising a plurality of generally parallel, spaced channels extending in the same general direction as the hot air stream flow and generally perpendicular to the cold air stream flow . . .”). A more restrictive definition in these circumstances is impracticable, unnecessary, and would only confuse the public.

For these reasons, Claims 1-10 are in condition for allowance and should be passed to issue. Such action is earnestly solicited.

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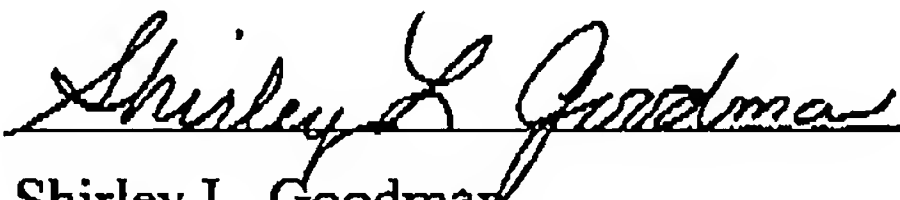
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I hereby certify that the enclosed Amendment is being faxed via (703) 872-9306 to Mail Stop Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 17th day of December, 2004.


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